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Husbandry and Medical Management of African Hedgehogs

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The African hedgehog, *Atelerix albiventris*, has become a very popular pet in the United States. At one time, this animal was being imported from its native land of Central Africa, but it is now being successfully bred in captivity in the United States. Another species that is also becoming popular is the African pygmy hedgehog, *Erinaceinae aethechinus*.

There are many species and variations of hedgehogs, differing in size, shape, and color. Although hedgehogs have a similar appearance to a porcupine, they are classified with the shrew and the mole in the order Insectivora. Hedgehogs belong to the family Erinacidae, which consists of three genera: *Erinaceus* (African and Eurasian hedgehogs), *Hemiechinus* (long-eared desert hedgehogs), and *Paraechinus* (desert hedgehogs).

The African hedgehog is found throughout Central Africa. Other commonly used names are the "white bellied," Central African, or the "four-toed" hedgehog. Other hedgehog species include the European hedgehog (*Erinaceus europaeus*), Pruners (Cape) hedgehog, and the Egyptian (long-eared) hedgehog, which tend to be aggressive and bite.

Extensive literature on the European hedgehog exists, but little information is available concerning the African species. Most of the data about hedgehogs comes from studies about European hedgehogs, which are commonly kept as pets in Europe. There are many differences between the African and European hedgehogs. One such difference is their size. African hedgehogs weigh 250-600 grams, whereas European hedge-

hogs can weigh up to 1100 grams. Additionally, European species are protected by law; consequently, they are not readily imported into the United States.

Anatomy

The hedgehog's body plan is very primitive. Hedgehogs have long pointed snouts, small eyes, short powerful legs for digging, and vestigial tails. The average life span is about 6-10 years. The average adult male weighs 500-600 grams, and the average adult female weighs 250-400 grams. Hedgehogs average 25 cm in length. The gastrointestinal system consists of a simple stomach with no cecum. The dental formula is incisors 3/2, canines 1/1, premolars 3/2, and molars 3/3, with a total of 36 teeth. The normal rectal temperature is 95-96°F.¹

Soft hair, ranging in color from tan to white, is located on the ventrum, face, and legs. There is also an area over the head in a cranial to caudal tract which lacks spines. Quill color can be either "salt and pepper" or pure white, which is called "snowflake." The rest of the body is covered by stiff pointed spines, which are 0.5 to 1 cm long. These are used as a covering for protection. Unlike a porcupine's spines, a hedgehog's spines are not barbed and do not detach. The males tend to have longer white spines, which usually have black or brown bands. To minimize weight without losing strength, each spine is filled with many small air-filled chambers separated by thin plates.² The base of each spine has a thin flexible neck, widening into a ball that is embedded in the skin. This allows the spine to bend and not be driven into the hedgehog if any pressure is placed on the spine (e.g., from a blow or fall). At the base of each spine is a muscle to allow erection of the spine. Usually the muscles remain relaxed to keep the spines flat against the body. If frightened, a hedgehog will immediately roll up and erect the

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spines. The spines protrude at different angles, criss-crossing to produce an impenetrable barrier. Excess skin over the body allows the hedgehog to curl up tightly. Beneath the skin lies a powerful muscle (the panniculus carnosus), which covers the back.² A circular band, called the orbicularis muscle, is located at the edge of the skin musculature. When the orbicularis muscle contracts, it acts like the drawstring around the opening of a bag, forcing the contents deeper into the bag as the string is drawn tighter.² Two small muscles pull the skin and circular muscle cranially to cover the head and caudally to cover the rump. As the orbicularis muscle contracts, the head and rump are pulled close together and the spines fully protect the underside of the hedgehog.

All hedgehogs are capable of undergoing periods of dormancy (hibernation) if the temperature drops below 45°F, during which time their body temperature drops to a level close to that of surrounding air (heterothermy).² This gives them the ability to reduce energy needs and survive when food is scarce. However, hedgehogs will not hibernate if kept warm and well fed. Since cool conditions can lead to respiratory disease, it is recommended that their environment be kept between 75-85°F.¹ Forty to seventy percent humidity is well tolerated.

Reproductive Facts

Sexual maturity occurs in females at 2-8 months and in males at 6-8 months of age. The female is a spontaneous ovulator and does not maintain a regular heat cycle. This means that they are capable of breeding whenever they have a chance to meet a male, making them proliferative pets. For this reason, some states prohibit keeping hedgehogs as pets. Their courtship is long and noisy, marked by snuffling and snorting noises. Females should not be bred until they are at least 6 months old.¹ Breeding of an immature female may lead to dystocia or death of the mother or young.

The most effective social grouping for reproduction appears to be a single male with several females, although pairs of animals may reproduce successfully.³ During breeding, the receptive female partially erects her spines and stands for mating. If



Helen Schubert, ISU

These hoglets are 5 days old. The hoglet in the center is a female, and the two on either side are males.

she is not ready to mate, she will erect the spines on her forehead and butt at the male. The male has a long penis that reaches cranially to the female's vulva, which lies slightly cranial to the anus. The female will lay her spines down and depress her back while the male mounts. The male holds the spines on her back with his teeth to provide stability during breeding. Copulation may occur several times during the mating period.

Pregnancy detection is difficult to assess in hedgehogs. Females that gain greater than 50 grams within three weeks of having access to a male are considered pregnant and should be isolated.⁴ Gestation lasts 34-37 days, and females can be rebred within a few days following weaning of the young. Litter sizes vary from 1-7 hoglets, with an average of three. Cannibalism does occur, so the males should be removed from the enclosure prior to parturition. Similarly, females will kill and eat the young of others. Many authors recommend that dams that have recently given birth not be disturbed for several weeks in order to prevent desertion or infanticide.³ If it is necessary to check the young, it is best to examine them when the mother has left the nest on her own.

Birth weight of a hoglet is 8-13 grams, and they should be weighed daily. Hoglets are born pink and hairless, with the spines located beneath the skin and surrounded by fluid to prevent damage to the mother's birth canal during parturition. Within 24 hours, the spines perforate the skin and harden, and the fluid is resorbed. The ears open at 10 days of age and the eyes open at 13-16 days of age. Hair appears on the ventrum and face by 3 weeks of age. Deciduous teeth

erupt at 4 weeks and the permanent teeth erupt at 7-9 weeks. When young hoglets are separated from the mother, they have a tendency to make a twittering whistle.

Hoglets should be weaned at 4-6 weeks of age. If the young are orphaned prior to reaching four weeks of age, it may be necessary to hand feed or cross-foster. Cross-fostering for at least the first 48-72 hours may provide better results in hand-raised young because it is thought that significant quantities of immunoglobulins are transferred in the colostrum during this time period.⁵ If cross-fostering is not possible, puppy or kitten milk replacer may be used, feeding every 3-4 hours with a feeding tube or small syringe. If hoglets are abandoned, it is necessary to stimulate defecation and urination by massaging the ventrum with a cotton tipped applicator from cranial to caudal. When the hoglets are ready to be weaned, it is advised to soften adult food to wean them onto solids.

Sexing is quite simple. The prepuce of the male is midway up the ventral abdomen, similar to a dog. However, the testicles are located within the abdominal cavity and remain there throughout life. The female's vulva is located cranial and ventral to the anus.

Behavior

Hedgehogs are terrestrial and nocturnal, preferring to be active in subdued light. They sleep soundly during the day, but at night they dig and run around in search of food. Hedgehogs have poor eyesight but have a keen sense of smell and hearing. Their sense of smell is mainly used to search for food and to detect scents that are important for communication. Due to their very acute sense of hearing, they prefer quiet environments and tend to react to any type of loud noise.

Self-anointing (otherwise known as "an-ting") occurs when hedgehogs encounter something new. This behavior involves rubbing saliva and food onto their spines with their tongues. One opinion is that this behavior is elicited by strong-tasting substances. The function of self-anointing is unknown but some theories include: 1) production of strong odors which act as a sexual attractant; 2) an attempt to clean the spines;

3) reduction of parasites on the skin; and 4) deposition of distasteful substances on the spines, thus deterring predators.² It is important to be familiar with the normal salivation associated with self-anointing so that it is not confused with rabies.

Hedgehogs make interesting noises. They grunt, hiss, and squeal when frightened or upset. These noises are not to be confused with respiratory abnormalities. If handled frequently, they are tame and usually do not display any aggression. They seldom bite, and if they do, it will rarely break the skin. With the use of the powerful muscles that arise from the head and neck on each side and loop around the rump, their defensive posture when frightened is to jump, freeze, tuck their faces, puff up and roll into a tight ball about the size of a grapefruit, with needle-like protruding quills that project in all directions. This position makes them painful to handle, and difficult, if not impossible, to examine and treat.

Housing

Housing should have smooth walls to prevent climbing and a floor with a lid to facilitate cleaning. About a two meter squared area should be provided per animal due to their increased activity at night. Wire is not recommended because they may catch their toes or limbs in the wire resulting in trauma or fractures. There should also be good air circulation without drafts.

A rock can be placed in the cage to allow them to sharpen their claws. Sufficient room is needed for them to exercise, as hedgehogs tend to become obese. For exercise, hedgehogs will use an exercise wheel made from wood pieces. Rodent wheels are not suitable because they can get their feet caught. Special wheels will soon be made available for hedgehogs. The wheel needs to be cleaned frequently, since they like to defecate while exercising.

Absorbent bedding such as pine shavings, shredded newspaper, or pelleted bedding can be used. The bedding should be at least three inches deep to allow digging. Cedar should not be used because the high concentration of aromatic oil tends to be a respiratory irritant and causes elevations in liver enzymes. Hedgehogs are also suscep-



African hedgehogs should be provided with a good hiding place. PVC pipe, flowerpots, cardboard, wood, or plastic boxes are commonly used.

tible to dermatitis from urine or fecal contamination. Therefore bedding should be cleaned frequently (at least once a week), and it may be helpful if an unscented shallow litter box is placed in the cage. Most hedgehogs are fastidious and roll in clean litter. Clumping cat litter should not be used because it may get in the ears, eyes, nose, and mouth and stick to wet areas on the skin, possibly leading to dermatitis. A good hiding area should also be provided. PVC pipes, flowerpots, cardboard, wood, or plastic boxes are commonly used for hiding nest boxes. When allowed to run free in the house, hedgehogs tend to hide and burrow in corners or under furniture and will dig in carpets and potted plants. They also forage for spiders and insects in the home if they are permitted to do so.

Although hedgehogs are largely solitary animals, they can be housed singly or in groups. However, only one male should be allowed per group, as they may fight and inflict trauma upon each other with their teeth and spines. Females usually adapt better to living in groups than do males.

As mentioned previously, hedgehogs require warm temperatures. The environmental temperature should be 75-85°F (25-35°C). If the temperature falls below this level, they may become immunosuppressed and be more susceptible to infections, particularly respiratory infections. If the temperature falls below 65°F (18°C), a hedgehog will go into a state of torpor. Temperatures over 85°F may result in heat prostration.

If owners insist on bathing their hedgehog, the use of a hypo-allergenic emollient shampoo such as Humilac or a pet shampoo

with carbaryl (safe for kittens, ferrets) for mite therapy is recommended.

Diet

Hedgehogs are mainly insectivorous, feeding on a variety of insects such as crickets, beetles, earwigs, snails, bees, and wasps. They also exhibit some omnivorous activity by eating worms, small mice, carrion, roots, berries, and small eggs. The exact nutrient requirements for the hedgehog are unknown, but many zoos have maintained their hedgehogs on a diet similar to the following:

- 25 grams dry light cat food or mixture of dry and canned food
- 10 grams diced fruit and vegetables
- 5 grams of live crickets and mealworms (3-4 times a week).

This diet is recommended by Dr. A. J. Smith at the El Paso Zoo in El Paso, Texas. It has been published in a Client Information Series publication on Care of Pet Hedgehogs produced by Veterinary Practice Company. Other diet choices include:⁶

DIET CHOICE 1 (for one adult hedgehog of 550g body weight)

- 1 heaping tsp. bird of prey diet or insectivore diet
- 1.5 heaping tsp. high quality cat/kitten chow (ex: Science Diet, Iams, C/D cat food, Ferret Chow)
- 1 heaping tsp. fruit/vegetable mixture*
- 10 small mealworms or 1-2 crickets (more if pregnant or lactating)

DIET CHOICE 2 (for one adult hedgehog/day)

- 3 heaping tsp. high quality cat/kitten chow
- 1 heaping tsp. fruit/vegetable mix*
- 6 small mealworms or 1-2 crickets

DIET CHOICE 3 (for one adult hedgehog/day)

- 3-4 teaspoons commercial insectivore diet (ex: Reliable Protein Products, Pretty Bird Intl.)
- 5-6 mealworms or 1-2 crickets

For younger or pregnant/lactating hedgehogs, kitten food can be offered. To maintain the increased energy requirements of lactating females, the caloric intake should be double the maintenance requirement. Young hedgehogs may eat an adult quantity depending on their life stage.

*(Fruit/vegetable mix: chop together 1/2 tsp. diced leafy dark greens (spinach, kale, leaf lettuce), 1/4 tsp. diced carrot, 1/4 tsp. diced apple, 1/4 tsp. diced banana, 1/4 tsp. diced grape or raisin.⁶)

Other items that may be successfully added to the diet include hard boiled eggs, evaporated milk, cottage cheese, waxworms, small mice, and vegetable/beef baby food. To introduce hedgehogs to new diets, it is necessary to mix the new food gradually into the old and make all the pieces similar in size to prevent them from selecting out the desirable pieces. Do not be fooled by commercial hedgehog diets, consisting of mainly peanuts and grain. They are not complete and must be supplemented with some of the foods and diets mentioned previously. Hard cat food aids in maintaining healthy teeth and gums.

Because hedgehogs have a high metabolism, the diet should be fairly high in protein and low in fat. It should provide balanced calcium and phosphorus levels, with a calcium and phosphorus ratio of 1.2-1.5:1.0 to prevent signs of calcium deficiency. Therefore, it is important to not maintain them on a strictly insect diet, because this will decrease the calcium intake and lead to a metabolic bone disease. Obesity is also a problem, and *ad lib* feeding is discouraged. Feed enough food for the hedgehog to consume during the night, and make sure that not much is left over by morning. The body weight should be monitored regularly.

As with any other animal, water should be available at all times from a water bottle or a bowl. When using a water bottle, be sure that the hedgehog knows how to use it. Choose heavy bowls that cannot be overturned by the hedgehog.

Handling and Restraint

While examining a hedgehog, it is a good idea to dim the lights and to eliminate loud noises. If the patient is not cooperating, light leather or rubber latex gloves can be used. Scruffing the skin between the ears and picking them up off the ground can prevent most of them from rolling up into a ball. When picking a hedgehog up from the floor, it is easiest to scoop them up and lift them off the surface. They generally unroll once they are lifted into the air. Most importantly, patience is required. If force is used, the hedgehog will roll up more tightly.

For an in-depth examination, it is usually necessary to sedate the patient. Isoflurane



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This female African Hedgehog, "Wedgie", gave birth to three hoglets five days before this photograph was taken.

works well to unroll the hedgehog. A large mask can be placed over the entire animal, or an induction chamber can be used.

Examination and Clinical Procedures

Hedgehogs should receive annual examinations, at which time diet, husbandry, habitat, and behavior of the patient should be reviewed. A complete physical exam, including an oral exam, should be performed. Yearly fecal flotations and direct fecal smears to detect gastrointestinal parasites are also necessary. Other procedures that may be warranted include: *Salmonella* culture, nail trimming, skin scraping, ear exam, fungal exam, CBC, chemistry panel, and radiographs. Finally, microchipping is an effective means of permanent identification.

Collecting blood will require anesthesia most of the time. Typical collection areas include the lateral and medial saphenous vein (which is the easiest to hit), and the cephalic vein. Small veins have a tendency to collapse, making it difficult to collect blood. The jugular vein and cranial vena cava can be used if large amounts of blood are necessary. However, the jugular vein is difficult to find due to its short length and the presence of extensive subcutaneous fat. If all else fails, do a toe nail clip to obtain 1-2 hematocrit tubes and a blood smear. One half milliliter of blood is usually adequate, but 5 ml of blood can be removed from a healthy adult. A 22-25 gauge needle without the syringe can be placed in the vein and the sample can be collected from the hub with hematocrit tubes.

Urine collection can be accomplished by catheterization of the bladder with a small gauge flexible catheter or by cystocentesis from a ventral percutaneous approach.

Injections can be given subcutaneously on the back or the flank while the patient remains rolled up into a ball. Be aware that due to the subcutaneous fat layers and poorly vascularized spines, the fluids may be slowly absorbed. Intramuscular injections can be done in the thigh but may require anesthesia. The lateral saphenous or jugular veins can be catheterized and used for intravenous drug administration. However, catheterization of these veins may be difficult. Placement of an intraosseous catheter may be performed more readily. When calculating drug dosages and fluid requirements, keep in mind that the poorly vascularized spines and subcutaneous fat account for 50% of the body weight. When administering subcutaneous fluids, 100 ml/kg of fluid can be given during one treatment, divided into two or three injection sites. An average adult hedgehog weighing 350-500 grams can handle 30-40 cc of fluid in the subcutaneous space.¹

Hematology and Reference Ranges

Parameter	Normal range
Hematocrit	36.0 - 38.5%
Hemoglobin	12.0 - 13.2 g/dl
RBC	7.03 - 7.64 x 10 ⁶ /ul
MCH	16.8-18.2 pg
MCHC	33.3 - 35.2 g/dl
MCV	49.1-53.2 fl
Reticulocytes	8 - 14%
Platelets	230 - 430 x 10 ³ /ul
WBC	6.3 - 9.6x 10 ³ /ul
Neutrophils	1.6 - 2.8 x 10 ³ /ul
Eosinophils	0.36 - 2.4 x 10 ³ /ul
Basophils	0.096 -0.45 x 10 ³ /ul
Monocytes	0 - 0.084 x 10 ³ /ul
Lymphocytes	3.72 - 6.14x 10 ³ /ul
Serum protein	51 - 72 g/liter
BUN	13.3 - 15.0 mmol/liter
Sodium	132 - 138 mmol/liter
Potassium	3.6 - 5.1 mmol/liter
Calcium	2.0 - 2.3 mmol/liter
Phosphorus	2.0 - 3.8 mmol/liter

These reference ranges are for the European hedgehog.⁷

Anesthesia

Physical examination or radiography of uncooperative animals can be made easier with the use of inhalation anesthesia, such as isoflurane or methoxyflurane. Induction can be accomplished with the use of a mask or in a chamber using 3-5% isoflurane and 100% oxygen. The hedgehog should be maintained at 0.5-1.5% isoflurane.

Injectable agents may be used, but recovery tends to be prolonged and occasionally rough. Some protocols such as ketamine HCl at 5-20 mg/kg alone, or with diazepam at 0.5-2 mg/kg or xylazine at 0.5-1.0 mg/kg IM have been used. Tiletamine HCl/ Zolazepam at 1.0-5.0 mg/kg IM is also acceptable.

Intramuscular ketamine HCl and isoflurane by mask can be used for general anesthesia for surgical procedures. Anesthesia lasts about 20 minutes, with a post-anesthetic sleeping recovery period of approximately 45 minutes.⁷

The patient should be kept warm to prevent hypothermia, and fluids may be administered IV, SC, or IP. Subcutaneous fluids take several hours to be absorbed from the adipose tissue, but a large volume of up to 100 ml/kg can be administered in several different areas.

Sodium pentobarbital can be used for euthanasia at a dose of 2-4 ml/animal administered intraperitoneally or intracardially.

Common Clinical Problems

Obesity and fatty liver disease (which is related to diet) is becoming more common as the interest in hedgehogs as pets continues to grow. Ad lib feeding is discouraged and reduced calorie cat food is recommended for adult hedgehogs.

Trauma due to male-male interactions may lead to severe wounds. Wounds tend to heal quite well, but keep in mind that contraction of the strong dorsalis caudalis muscles can lead to dehiscence. The muscle layers should be identified and sutured in the appropriate layers. The use of topical and systemic antibiotics should be based on the results of culture and sensitivity. Hedgehogs tolerate bandages and splints well, but

the external fixation of bone fractures is not possible. The use of Rush pins has also proven unsuccessful, presumably because of the strong roll up mechanism.⁷

Neoplasia occurs commonly in animals over the age of three years, and hedgehogs are very susceptible to a wide variety of tumors. Squamous cell carcinoma is commonly diagnosed in hedgehogs. Initial signs may appear similar to periodontitis and gingivitis, but the mass begins to spread to the nasal cavity and the orbit. Various types of neoplasia are becoming more common in clinical practice. As of now, there is no data available concerning cancer therapy with hedgehogs. Papillomas, ranging in size from small solitary nodules to widely disseminated masses, can be easily excised but tend to reoccur in different locations. All excised masses should be submitted for histopathology for a definitive diagnosis.

Dental problems, such as fractured and abscessed teeth, are common causes of anorexia, weight loss, and salivation in hedgehogs.⁵ Radiography may aid in the diagnosis of dental disease. Treatment consists of extraction of all affected teeth and systemic antibiotics. Even if extraction of the entire dentition is necessary, hedgehogs do well as long as a soft diet is provided. Most dental problems are due to improper diets which can cause periodontitis and gingivitis. Inappropriate food consistency is the most common dietary problem.

Some gastrointestinal diseases include gastric foreign bodies (including trichobezoars), and inflammatory gastrointestinal diseases due to infectious agents, neoplasia, or toxins.¹

Infectious Diseases

Viral Diseases

Foot and mouth disease This is caused by an enterovirus of the family Picornaviridae. It has an acute onset and is highly contagious. Signs include erythema, vesicles, and swelling of hairy parts of the body, as well as the feet, lips, and perineum.⁷ Anorexia, sneezing, and hypersalivation are other common signs. At times, affected animals seem dazed and become abnormally active during the day. It is unknown whether these animals serve as a reservoir for foot

and mouth disease, but they can be asymptomatic carriers. There is no known cure for foot and mouth disease. Although treatment may alleviate clinical signs, it does not prevent spread of infection.

Rabies Hedgehogs have been suspected of having rabies because of the physiological salivation involved in self-anointing, but only three cases have been reported in Germany.⁷

Bacterial Diseases

Salmonellosis Common signs include mucoid green diarrhea, dehydration, anorexia, and sudden death. However, 28% of clinically healthy animals have been shown to be positive for *Salmonella*.⁷ Some species such as *S. typhimurium*, *S. enteritidis*, and *S. dublin* can cause serious and potentially fatal disease in many species of animals, including humans. This is a significant public health issue. Therefore, it is prudent to culture stool if the hedgehog is entering a household with children or debilitated, geriatric adults. Treatment consists of Enrofloxacin or Trimethoprim sulfa, or as indicated by culture and sensitivity results. Treatment should probably be extended for at least 30 days and the public health significance of potential carriers should be weighed carefully.¹ Currently there are no studies indicating that *Salmonella* can be eliminated from a hedgehog.

Respiratory Infections Low environmental temperatures contribute to the development of respiratory infections caused by *Bordetella bronchiseptica* and *Pasteurella* spp. *Pasteurella multocida* infection causes purulent bronchopneumonia with pulmonary fibrosis, atelectasis, and abscessation. *Bordetella bronchiseptica* usually occurs secondary to other respiratory infections or diseases. Hematology, radiography, and tracheal wash cytology and culture should be performed to obtain a diagnosis. Treatment generally involves the use of broad spectrum antibiotics such as Trimethoprim sulfa and Enrofloxacin.

Yersinia pseudotuberculosis Clinical signs include rear leg weakness, chronic weight loss, and signs of liver disease. Post-mortem exam reveals necrotic foci in the liver and spleen, and enlargement of lymph nodes. Medical management includes parenteral fluids, supplemental heat, and

saline nebulization with antibiotics.

Other Tularemia, Leptospirosis, and Q fever are just a few other infectious diseases known to occur in wild hedgehogs. Hedgehogs are bred in captivity to prevent these diseases from becoming a common problem in pet hedgehogs.

Fungal Diseases

Dermatophytosis, characterized by crusts around the base of the spines and powdery, cracked skin with no signs of pruritus, is caused by *Trichophyton mentagrophytes* and *Microsporum* spp. It can be easily confused with mite infestations, but no regression of lesions will be noticed with Ivermectin treatment.

Diagnosis is based on fungal culture, and treatment involves topical antifungal therapy, as well as oral griseofulvin at suggested feline dosages. Mycotic infections may be secondary to mange, scratch wounds, or *Staphylococcus aureus* dermatitis.⁶

Parasitic Diseases

Endoparasites Wild hedgehogs suffer from many endoparasites, including coccidia, capillaria, tapeworms, and intestinal flukes. The European hedgehog is particularly susceptible to lungworm. Hedgehogs in the United States usually are not affected because they are bred in captivity, but it is important to do a routine fecal examination. All species of hedgehogs are susceptible to Toxoplasmosis from eating raw meat. They can also be infected with tapeworms by consuming insects infected with the larva of *Hymenolepis erinacei*. Endoparasites can be eliminated with Pyrantel pamoate (Strongid) or Ivermectin (Ivomec).⁷

Ectoparasites Fleas and ticks can be picked up outside or from other animals in the house. This causes pruritus which can lead to a secondary fungal infection. Treatment consists of dusting with flea powder or using a pyrethrin-based flea spray.⁷

Ear infections are treated similarly to small animals. Exudate from the ears should be examined for mite infestation. Hedgehog mites may look very similar to *Chorioptes*, but actually they are *Caparinia tripilis*. Mite infestation may result in skin scaling, loss of quills and hair, hyperkeratosis of the ear margins, pruritus and/or otitis. Diagnosis is easily made by skin scraping. Treatment consists of Ivermectin at 0.2-0.5 mg/kg PO

or SQ at 2 week intervals for 3 treatments. Dips with Amitraz or organophosphate insecticides are also effective. The environment and other animals should be treated as well.

Conclusion

Keep in mind that most common disease etiologies in exotic animals are due to husbandry and nutrition. Veterinarians need to remain knowledgeable and understand the proper husbandry and medical management of hedgehogs as they begin to increase in popularity.◆

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Please turn the page for the African Hedgehog Formulary.

AFRICAN HEDGEHOG FORMULARY

MITES

Amitraz (Mitaban)

Topically: 0.3% weekly for 2-3 weeks

Ivermectin

SC or PO: 0.2-0.5mg/kg 2 weeks apart for 3 treatments

ANTIBIOTICS - BROAD SPECTRUM

Amoxicillin

PO, IM: 15 mg/kg q 12 hours

Chloramphenicol (bacteriostatic, Salmonella)

30 mg/kg q 12 hours

PO: 50 mg/kg q 12 hours

Enrofloxacin

PO, IM, SC: 5.0-10 mg/kg q 12 hours

Oxytetracycline

PO: 50 mg/kg daily, administer in food for 5-7 days

ANTIBIOTICS - GRAM POSITIVE

Penicillin G

40,000 IU/kg q 24 hours

Ampicillin

10 mg/kg q 24 hours

Erythromycin: Penicillin resistant

PO, IM: 10mg/kg q 12 hours

ANTIBIOTICS - GRAM NEGATIVE

Sulfadimethoxine

SC, PO: 2-20 mg/day, treat for 2-5 days, off 5, repeat

Trimethoprim/sulfa (25 mg tri + 5 mg sulfa)

PO: 30 mg/kg q 24 hours

MYCOPLASMA

Tylosin

PO: 10 mg/kg q 12 hours

PARASITES

Fenbendazole (panacur)

PO: 10-30 mg/kg repeat q 2 weeks

Praziquantel (Droncit)

PO, SC: 7 mg/kg once, repeat q 2 weeks (Cestodes)

Ivermectin (Ivomec 1%)

PO, SC: 0.2 mg/kg repeat q 2 weeks

Mebendazole (Telmin)

PO: 15 mg/kg repeat q 2 weeks (Nematodes)

PO: <500 g BW=25 mg q 12 hours; >500 g BW=50 mg q 12 hours for 5 days, repeat after 2-3 weeks.

Metronidazole

PO: 25mg/kg q 12hours

FUNGAL

Griseofulvin (microsize)

PO: 50 mg/kg/day q 8-12 hours

Ketoconazole (Nizoral)

PO: 10mg/kg q 24hours

ANALGESIC

Butorphanol

SC: 0.05 mg/kg q 8 hours PRN

Ketamine

5-20 mg/kg

Tiletamine HCl/zolazepam

1.0-5.0 mg/kg

Xylazine

0.5-1 mg/kg

ANESTHESIA

Diazepam

0.5-2 mg/kg

Isoflurane

Mask: To effect

FRACTURES

Calcium gluconate 10%

0.5 ml/kg

ALLERGIES, INFLAMMATION, SHOCK

Dexamethasone

0.1-1.5 mg/kg

—: up to 5 mg/kg shock

Prednisone

SC: 2.5 mg/kg q 12 hours prn

—: 10mg/kg

VITAMINS

Vitamin A

400 IU/kg q 24 hours for 10 days

Skin disorders, excessive spine loss, rule out infections

Vitamin B complex

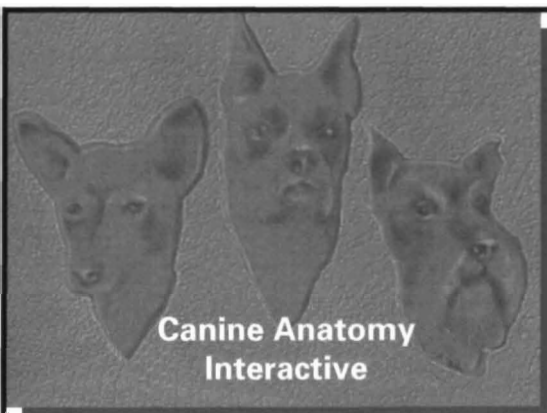
1 ml/kg

CNS signs, paralysis of unknown origin, anorexia

Vitamin C

PO, SC: 50-200 mg/kg

Vitamin C deficiency, infections, gingival disease, support of recovery from all infections: use 1000 mg ascorbic acid/ 1 L drinking water - change daily.



Canine Anatomy Interactive

A CD-ROM for preview and review of the anatomy of the dog.

Purchase from:

Images 4U, c/o Don Adams
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College of Veterinary Medicine
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